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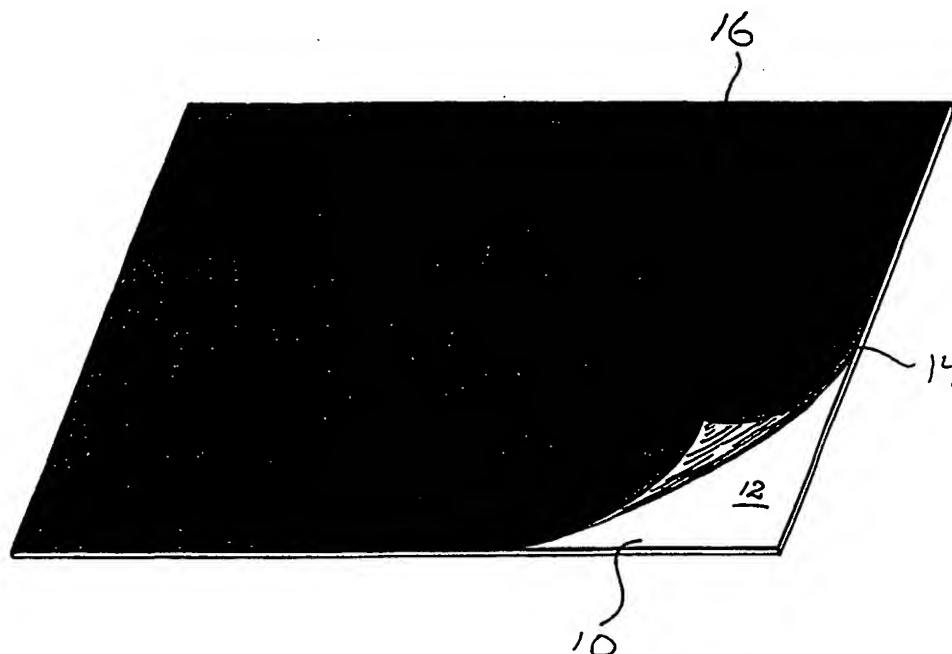
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(21) International Application Number: PCT/SE99/00759 (22) International Filing Date: 6 May 1999 (06.05.99) (30) Priority Data: 9801710-6 14 May 1998 (14.05.98) SE (71)(72) Applicant and Inventor: ENSSON, Lars, Johnny [SE/SE]; Storgatan 26, S-671 31 Arvika (SE). (74) Agents: HYNELL, Magnus et al.; Hynell Patenttjänst AB, Patron Carls väg 2, S-683 40 Hagfors/Uddeholm (SE).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>In English translation (filed in Swedish).</i>

(54) Title: METHOD FOR PRODUCTION OF A MOP FRAME ASSEMBLY



(57) Abstract

The present invention relates to a method for production of mop frames (16). The method is characterized in that it comprises the stages of applying Velcro® hooks (14, 22) to one side of a sheet (12, 20) which is substantially twist-resistant and flexurally rigid, principally on the whole of its surface, and of cutting out the shape of the mop frame from the sheet.

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METHOD FOR PRODUCTION OF A MOP FRAME ASSEMBLY.

TECHNICAL FIELD

The present invention relates to a method for production of mop frames and to a mop frame manufactured according to the method.

BACKGROUND TO THE INVENTION

A number of mop frames of varying design have been produced over the years. For relatively many years, Velcro® fastenings have been used attached to the underside of the frame to hold a mop cloth and the like in place, but at the same time detachably for exchange of the mop.

The Velcro® fastenings are conventionally formed as tapes, which are mounted on plastic strips, which in turn are affixed detachably to a frame of aluminium. The underside of the frame is thus formed with grooves, often two parallel grooves, into which such strips with tapes are inserted. The reason for this design is partly that the Velcro® tapes are relatively expensive to purchase, in which case it has not been wanted to cover the whole of the underside, partly that the Velcro® tapes are of a relatively great thickness, which means that the frame as a whole acquires an unnecessarily great thickness if the tapes are applied directly to the sheet, and partly that it has been desirable, particularly in the professional cleaning sector, for the Velcro® tapes to be exchangeable, as these have a tendency to become covered by dirt and dust following long use.

The reason for using aluminium frames commercially is that cheaper construction material, such as plastic for example, does not normally lead to a cost reduction owing to its elasticity, as very thick sheets are required in order to obtain sufficient flexural rigidity. It is of course important that a mop frame can give some surface pressure along the whole of its length on use. A frame which is too flexible would give insufficient surface pressure at the ends, where it would be hard for the force transferred from the handle down through the fastening to be transmitted to a flexible sheet. Generally speaking, it is however a disadvantage that such an expensive construction material as aluminium normally has to be used.

The disadvantages of this design, aluminium frames with grooves in and strips with Velcro® tape, are that it makes the product relatively expensive, and unnecessarily

complicated for many application areas, at a price which the professional cleaning sector may accept but not domestic households in the great majority of cases.

DISCLOSURE OF THE INVENTION

The object of the present invention is to produce a mop frame with the same functionality with regard to cleaning as the conventional mop frames but without the designs which increase the price and which are unnecessary for many application areas.

This is achieved according to an aspect of the invention by a method characterized in that it comprises the stages

- a) extrusion of a substantially twist-resistant and flexurally rigid sheet of polymer material,
- b) application of Velcro® hooks to one side of said sheet,
- c) cutting out of the mop frame shape from the sheet.

According to another aspect of the invention, this is characterized in that the Velcro® hooks are attached to the sheet by means of gluing, preferably directly following extrusion, in order to utilize the heat.

The advantages of the invention are several. Due to the fact that the frame is extruded from cheap polymer material and a Velcro® mat or strips are applied to the sheet or belt directly following extrusion, after which the shape of the mop frame is cut out, simple and cost-effective production is obtained. On the whole, the alignment between sheet and mat, which would be the case if the parts were cut out separately in order then to be put together, is dispensed with.

According to further aspects relating to a method according to the invention, the object is:

- that the sheet is formed as an elongated belt of a width corresponding to the width of the mop frame, and that the belt is cut directly following extrusion to correspond to the final shape of the mop frame,
- that the Velcro® hooks are arranged on a mat or fabric of substantially the same size as the sheet to which it is applied,
- that the Velcro® mat is of the type which is extruded and rolled using perforated rollers, the material which penetrates the perforations on rolling forming hooks,

- that said sheet is extruded so that grooves are formed and that said Velcro® hooks are formed in the form of tapes which are placed in said grooves,
- that said grooves are of a depth d which is essentially less than the thickness t of the Velcro® tape, in which case preferably $d \sim t-1$ mm, and
- that said polymer is foamed so that the finished sheet contains air inclusions, polypropylene or ABS plastic preferably being used.

According to a further aspect of the invention, a mop frame is contemplated produced according to the method specified above, in which case:

- it has a width of 60-100 mm, preferably 70-90 mm, and a thickness of 3-7 mm, preferably 4-6 mm,
- this also comprises a fastening element for attachment of a handle,
- said fastening element is arranged on the top side of the frame so that the top side assumes a convex shape in a longitudinal direction,
- said fastening element is provided on the underside at each outer edge with a raised part,
- arranged on the top side of the frame at each outer edge of said fastening element are raised parts, and
- arranged on the top side of the frame in the area of the centre point of said fastening element is a recess.

These and other aspects and advantages of the present invention will be evident from the detailed description of a preferred embodiment and from the following claims.

BRIEF DESCRIPTION OF DRAWINGS

In the description of a preferred embodiment below, reference will be made to the enclosed drawings. In these

Fig. 1 shows a variant of the method for producing a mop frame according to the invention,

Fig. 2 shows another variant of production,

Fig. 3 shows a view in perspective from underneath of a mop frame produced according to the invention,

Fig. 4 shows a view in perspective from above of a mop frame according to Fig. 3,

Fig. 5 shows a view in perspective from above of a mop frame according to a preferred embodiment, and

Fig. 6 shows a section along the line of symmetry A-A of the embodiment according to Fig. 5.

DESCRIPTION OF A PREFERRED EMBODIMENT

The method for production of mop frames according to the invention which is shown in Figs. 1 and 2 includes the use of a sheet 10 of a certain thickness and of a material of a certain flexural rigidity and twist resistance. A mat 14 or fabric with Velcro® hooks is applied to one side 12 of the sheet, preferably by gluing. The mop frames 16 are then cut out in their finished shape by a suitable manufacturing method, preferably punching.

The sheet is preferably produced by means of extrusion of a foamed plastic material, for example polypropylene, with desired properties so that the frame acquires sufficient flexural rigidity and twist resistance on the one hand and withstands commonly occurring cleaning fluids on the other. In contrast to conventional mop frames which are equipped with grooves and recesses, the mop frame according to this embodiment is completely smooth both on the top and bottom side, i.e. devoid of dirt-accumulating pockets, which also makes the cost of producing the sheet considerably lower. Due to the fact that the entire underside of the frame is formed with Velcro® hooks, satisfactory attachment is obtained for mop cloths and the like. In addition, even contact is obtained with the floor, which gives a better cleaning result.

The glue is preferably a rubber-based glue in order to obtain a certain elasticity at the join. The glue can either be applied to the sheet, following which the Velcro® mat is pressed on securely, or to the underside of the Velcro® mat. The glue can also be pre-applied to either the sheet or the Velcro® mat, which glue is activated on use by coating with a suitable solvent, such as acetone.

The Velcro® mat is preferably of the type which is produced by extrusion of a plastic material to form a mat, which is then rolled with perforated rollers, the plastic penetrating through the holes in the rollers and forming hooks with a Velcro® function. The advantage of this type of Velcro® mat is that its thickness is considerably less than conventionally produced Velcro® products which are usually produced as tapes, and that the cost of manufacture is considerably lower than for conventional Velcro® products. This means that the height of the finished frame is not affected to any greater extent by the Velcro® mat. In addition, good adhesion is obtained on the whole contact surface between the underside of the frame and a mop cloth, at the same time as the low

height of the hooks of the Velcro® mat means that the mop does not stick so firmly that removal is made difficult.

The mop frames can be cut out from the sheet using any suitable method such as jig-sawing, water-cutting, punching or the like.

Fig. 2 shows a variant of the method for production of mop frames. In this case the sheet is formed as an elongated belt 20, the width of which corresponds to the width of the finished mop frame. The Velcro® mat, which is formed in this case as an oblong strip 22 of substantially the same width as the belt, is applied to one side of the belt. When the mat is applied, the belt is cut with the strip in such a way that the frame 16 directly obtains its final shape. This is best done by means of punching/cutting, two different cutting tools being used (not shown), where one cuts one edge at a first angle and the second cuts the other edge at another angle, so that a shape of the mop frame is obtained with a longer front edge than back edge (see Fig. 3).

In this case it is also conceivable to extrude the belt and Velcro® strip at the same time, either by these being produced in an integrated manner in the same extrusion process or by these being manufactured separately and these being pressed against one another in a warm state, at which they will then stick to one another without glue.

The mop frame 16 produced according to the above method which is shown in Figs. 3 and 4 will thus have a flat underside 24 mainly covered with a Velcro® mat and a flat and smooth top side 26. The corners 28 are preferably somewhat rounded and the short ends somewhat inclined, in which case one long side will be somewhat longer than the other long side. Arranged on the top side is a fastening element 30, an articulated handle holder in the embodiment shown. The holder is attached in a suitable manner using rivets, screws or the like, 32, for example.

Fig. 5 shows a mop frame 16 according to the invention in a view diagonally from above. The mop frame 16 consists of a sheet 20, which is extruded so that grooves 40, 41 are formed, arranged inside which are Velcro® tapes 14A, 14B. The Velcro® tapes 14A, 14B are approx. 1.8 mm thick. The groove has a depth d of approx. 0.8 mm, so that the Velcro® hooks project approx. 1 mm outside the lower surface of the sheet 20. Fastened to the top side 26 of the sheet 20 by means of screws 32A-32D is a fastening element 30 for attaching a handle (not shown). The fastening element 30 is provided with holders 35 intended to be able to receive the fastening device of the handle in a

pivoting manner. The sheet 20 is affixed to the fastening element 30 in such a way that its top side 26 assumes a somewhat convex shape in the longitudinal direction (see Fig. 5). This is achieved by means of the fact that arranged at each outer edge 33 of the fastening element 30 is a protruding part 34. Due to the fact that the fastening element 30 is provided with protruding edge parts 34, the frame 20 will, on attachment of the screws 32A-32D, which are located at least partly inside said edge parts 34, be bent in the longitudinal direction, as the central part 29 of the frame will be drawn up to lie close to the fastening element's surface 37, which is at a different level to the edge parts 34, whereby bending occurs.

Fig. 6 shows an alternative embodiment to obtain the same effect as described in connection with Fig. 5, namely by arranging the raised/protruding parts 36 on the frame part 20 (instead of on the fastening element 30). This is best achieved in a simple manner by pressing against the top part of the frame in the warm state, so that a suitable quantity of material moves from an adjacent part 39 to said bump 36.

Fig. 6 also shows that countersunk screws are best used for mounting, the holes in the sheet 20 being made so that counterbores 25 are obtained. According to a preferred method, both hole-making and countersinking are executed in the same stage by means of a punching/ pressing operation, a punching tool (not shown) being used with an outer circular part which has a diameter corresponding to the hole 29 in the sheet 20 and then a cone corresponding to the counterbore 25 and following on from the greatest diameter of the cone a pressing surface which is intended to ensure that no material is pushed to the side and thereby changes the surface evenness of the sheet. Thanks to said punching operation and the use of countersunk screws, a secure mounting is obtained, which guarantees suitable bending/convexity and which at the same time eliminates the risk that the fastening element 32 has protruding pieces, which could damage a floor surface.

It is to be understood that the invention is not restricted to the embodiment described above and shown in the drawings, but can be modified within the scope of the following claims. Thus it is understood for example that many suitable plastics other than polypropylene can be used. Furthermore, it is understood that varying thicknesses of Velcro® tapes can be used, etc. In addition, it is understood that instead of protruding/ raised edge parts, a central recess can also be used in order to obtain the desired bending of the mop frame.

CLAIMS

1. A method for production of mop frames (16), characterized in that it comprises the stages
 - a) extrusion of a sheet (12, 20) of polymer material which is substantially twist-resistant and flexurally rigid,
 - b) application of Velcro® hooks (14, 22) to one side of said sheet (12, 20)
 - c) cutting out of mop frame shape from the sheet.
2. A method according to claim 1, characterized in that the Velcro® hooks are affixed to the sheet by means of gluing, preferably directly following extrusion in order to utilize the heat.
3. A method according to claim 1 or 2, characterized in that the sheet is formed as an elongated belt with a width which corresponds to the width of the mop frame, and that the belt is cut directly following extrusion to correspond to the final shape of the mop frame.
4. A method according to any of the previous claims, characterized in that the Velcro® hooks are arranged on a mat or fabric of substantially the same size as the sheet to which it is being applied.
5. A method according to claim 4, characterized in that the Velcro® mat is of the type which is extruded and rolled with perforated rollers, the material which penetrates the perforations on rolling forming hooks.
6. A method according to any of the previous claims, characterized in that said sheet is extruded so that grooves (40, 41) are formed and that said Velcro® hooks are formed in the form of tapes (14A, 14B) which are placed in said grooves.
7. A method according to claim 6, characterized in that said grooves have a depth (d) which is essentially less than the thickness (t) of the Velcro® tape, in which case preferably $d \sim t-1$ mm.
8. A method according to any of the previous claims, characterized in that said polymer is foamed, so that the finished sheet contains air inclusions, polypropylene or ABS plastic preferably being used.

9. A mop frame produced according to the method in claim 1, characterized in that it has a width of 60-100 mm, preferably 70-90 mm, and a thickness of 3-7 mm, preferably 4-6 mm.
10. A mop frame according to claim 9, characterized in that it also comprises a fastening element (30) for attaching a handle.
11. A mop frame according to claim 10, characterized in that said fastening element is arranged at the top side of the frame so that the top side assumes a convex shape in a longitudinal direction.
12. A mop frame according to claim 11, characterized in that said fastening element is provided on the underside, at each outer edge 33, with a raised part (34).
13. A mop frame according to claim 11, characterized in that arranged on the top side of the frame at each outer edge (33) of said fastening element are raised parts (36).
14. A mop frame according to claim 11, characterized in that arranged in the area of the centre point of said fastening element is a recess.

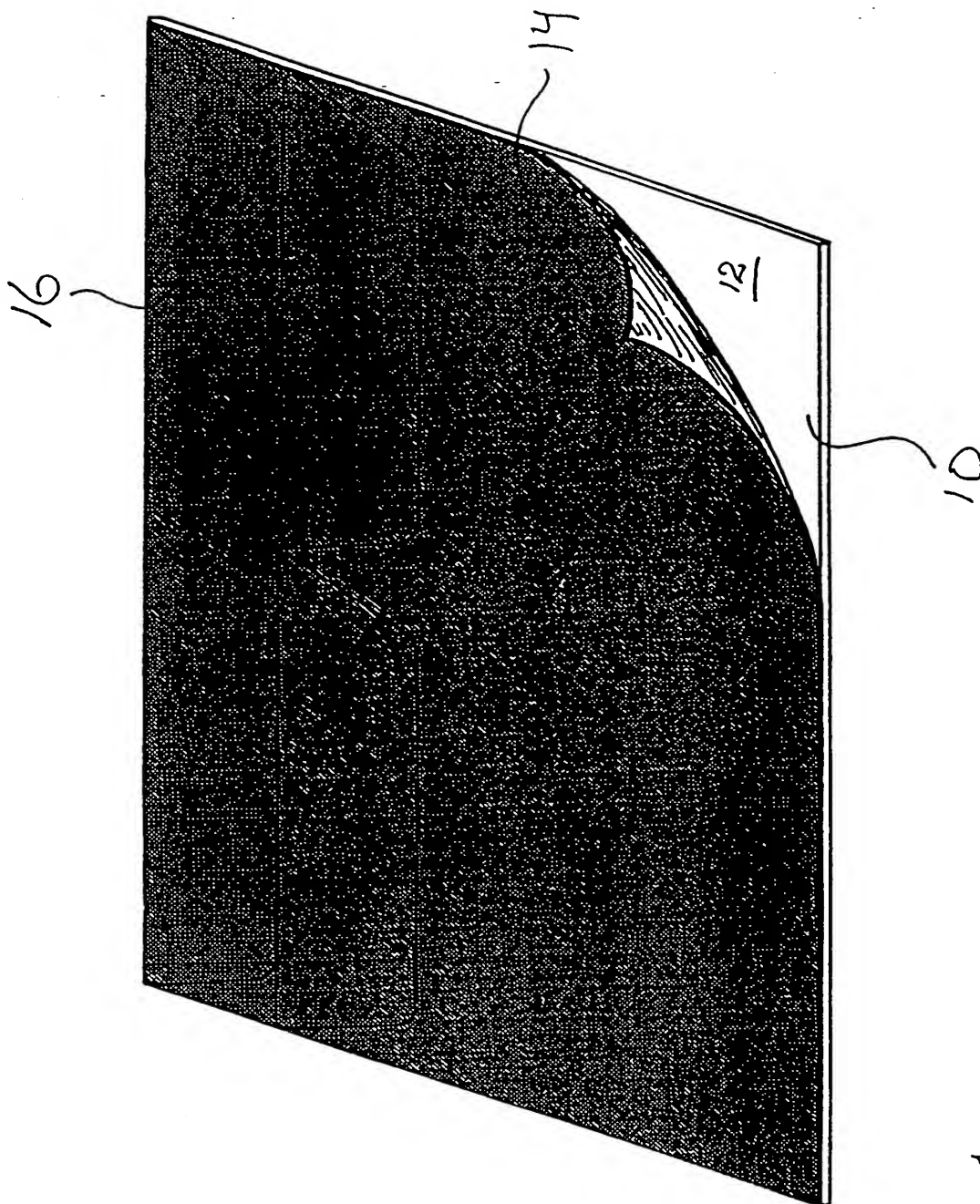


Fig. 1

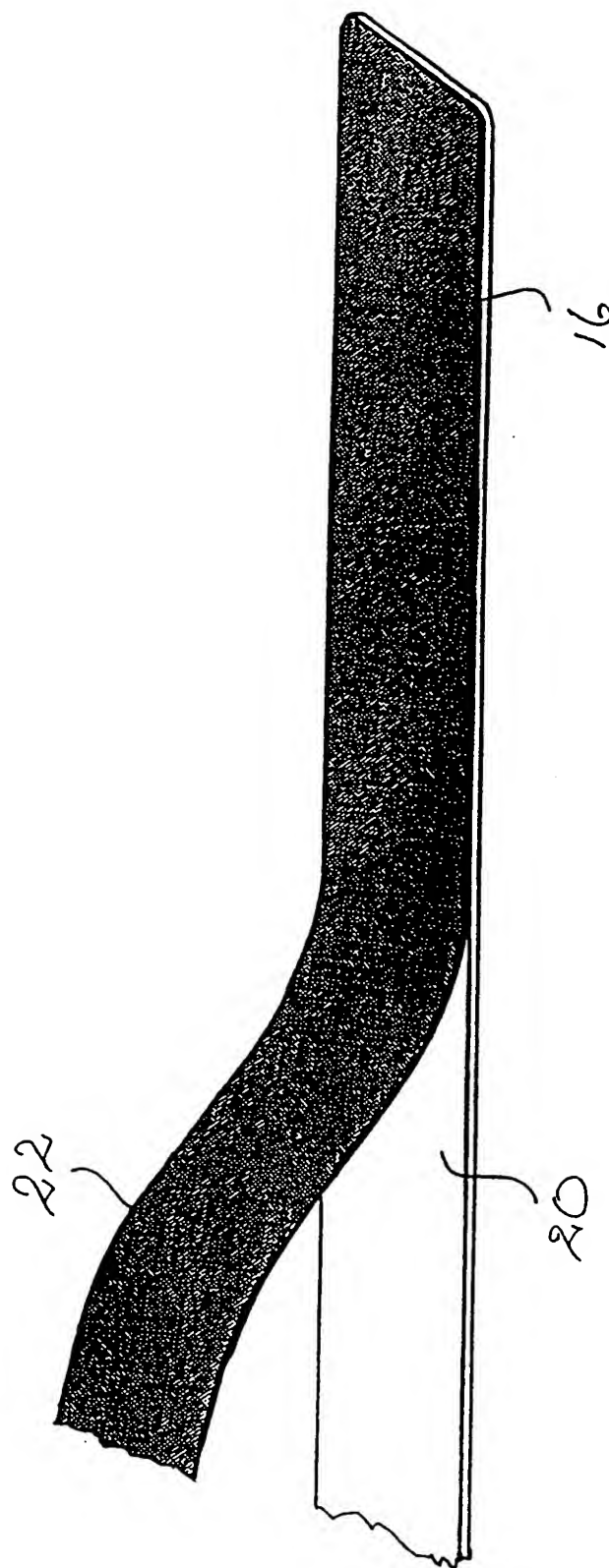


Fig. 2

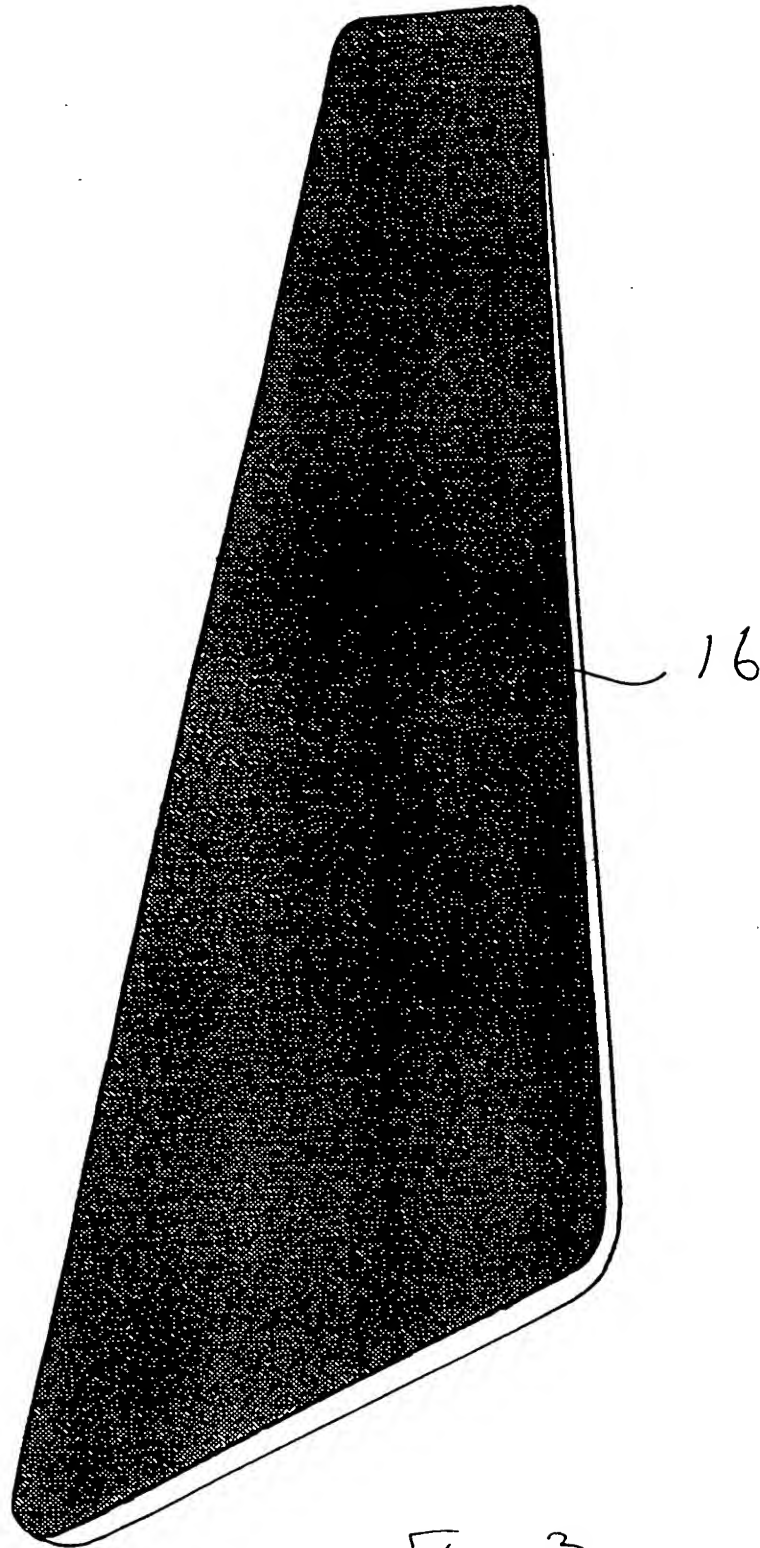
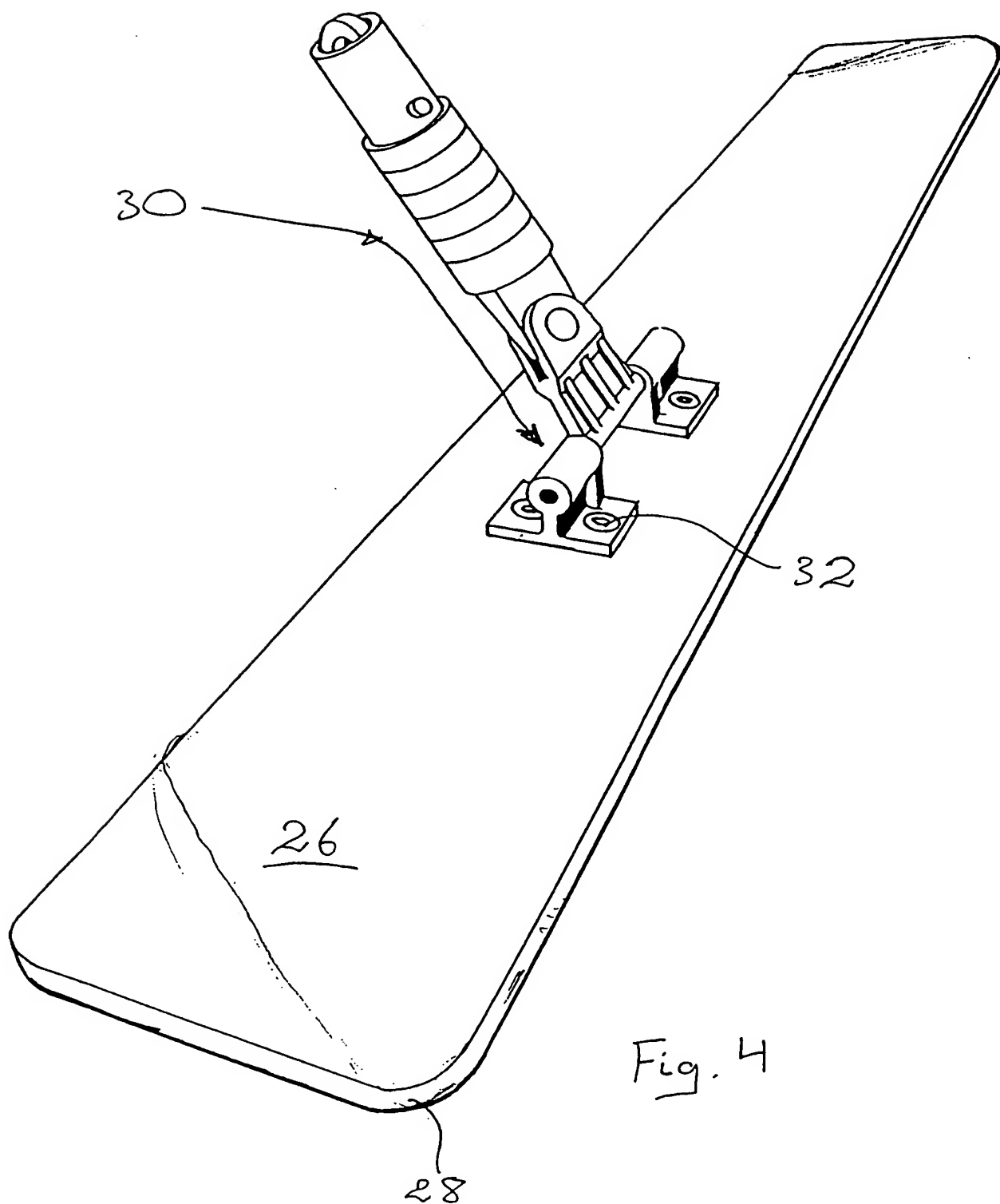


Fig. 3



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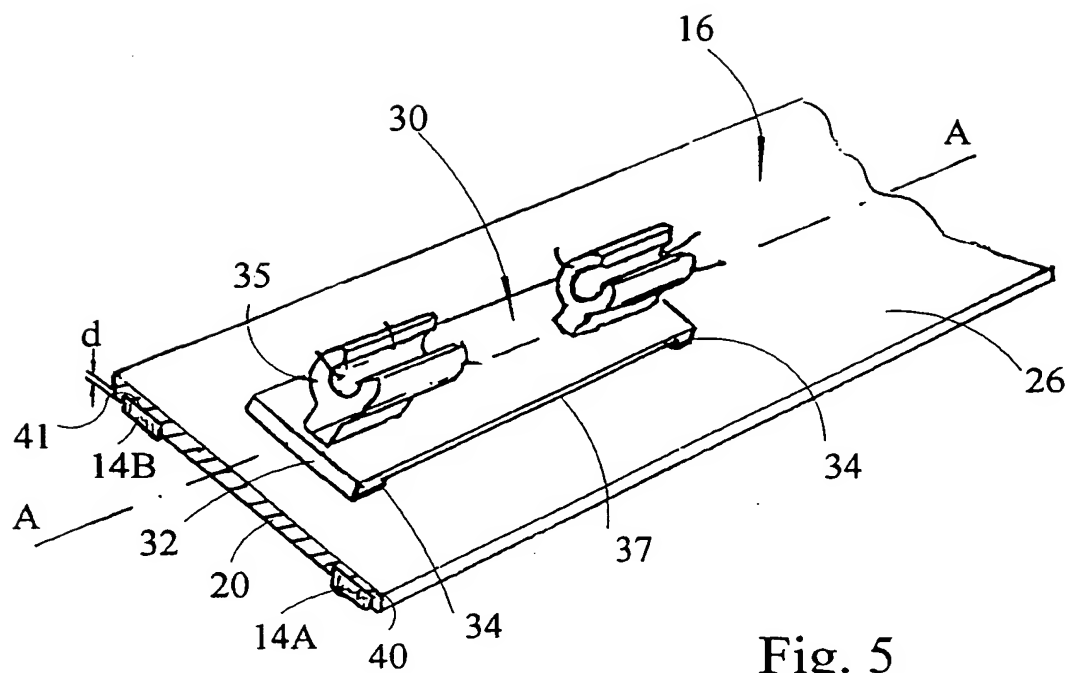


Fig. 5

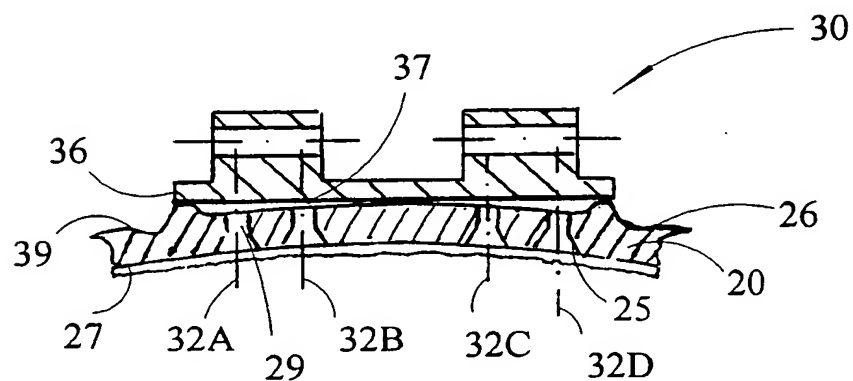


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/00759

A. CLASSIFICATION OF SUBJECT MATTER

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	DE 9000477 U1 (SCHNEBEL, KARL-HEINZ), 30 August 1990 (30.08.90), page 1, line 1 - line 15, figures 1,3 --	1-5,8-10
Y	US 3574019 A (L.H. GIRARD), 6 April 1971 (06.04.71), column 3, line 73 - line 74, figure 1 --	2

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INTERNATIONAL SEARCH REPORT

Information on patent family members

02/08/99

International application No.

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